Michael Salter-Townshend, Ph.D., M.Sc.

School of Mathematics and Statistics
University College Dublin
Ireland

michael.salter-townshend@ucd.ie
www.maths.ucd.ie/~mst

Present Appointment

Associate Professor, School of Mathematics and Statistics, University College Dublin (2025-).

Previous Appointments

Assistant Professor, School of Mathematics and Statistics, University College Dublin (2017-2025).
Postdoctoral Researcher, Simon Myers Group, Dept. of Statistics, University of Oxford (2013-2016).
Junior Research Fellow, Mansfield College, University of Oxford (2013-2016).
Postdoctoral Researcher, Clique Cluster, University College Dublin (2009-2013).

Qualifications

Ph.D. Statistics, Trinity College Dublin, (2004-2008).
M.Sc. High Performance Computing, Trinity College Dublin, (2003-2004).
B.A. Mod. Computational Physics, Trinity College Dublin, (1999-2003).

Lecturer

Monte Carlo Inference, University College Dublin (2022-2024).
Inference for Data Analytics, University College Dublin (2021-).
Time Series, University College Dublin (2017-2022, 2025-).
Bayesian Analysis, University College Dublin (2017-2021).
Statistics Using R for Computational Biologists, University College Dublin (2011, 2012, 2013).
Case Studies in Simulation Science, University College Dublin (2013).
Statistics and Mathematics in Computational Biology, University College Dublin (2009, 2010).
Transferable Skills: Statistics I and II (Ph.D. level), University College Dublin (2010, 2011).
Advanced Quantitative Research Methods module, School of Nursing, Trinity College Dublin (2007).
Introduction to Management Science, Dept. of Statistics, Trinity College Dublin (2007).

Tutor

Visiting Students' Tutor in Statistics, Mansfield College, University of Oxford (2015, 2016).
Stochastic Models in Mathematical Genetics, University of Oxford (2014, 2015).
Introduction to Unix, School of Mathematics, Trinity College Dublin (2005-2006).
Numerical Computing, School of Mathematics, Trinity College Dublin (2005-2007).

Graduate Student Supervision

- Alan Kamara, Ph.D. Rinn AI Centre, UCD (2026-).
- Joshua Musau, Ph.D. AIMSIR Centre, UCD (2026-).
- Kseniia Maksimova, Ph.D. SFI CRT Genomics Data Science, UCD (2022-2026).
- Jinbo Zhao, Ph.D. Insight funded, School of Mathematics and Statistics, UCD (2017-2023).
- Catherine Mahoney, Ph.D. Bioinformatics and Systems Biology, UCD (2019-2023).
- Prabhleen Kaur, Ph.D. SFI CRT Foundations of Data Science, UCD (2019-2024).
- James Ward, Ph.D. SFI CRT Genomics Data Science, UCD (2019-2023).
- Kim Conteddu, Ph.D. SFI CRT Foundations of Data Science, UCD (2021-2024).
- Chiara Cotroneo, Ph.D. Computational Infection Biology, UCD (2017-2020).
- M.Sc. in Statistics, University College Dublin (2017-2025).
- M.Sc. in Data and Computational Science, University College Dublin (2017-2025).
- M.Sc. in Actuarial Science, University College Dublin (2017-2018).
- M.Sc. in Applied Statistics, University of Oxford (2014, 2016).

Ph.D. Examination

- External Examiner for Ph.D. Bioinformatics, Ulster University (2024).
- Internal Examiner for Ph.D. Statistics UCD (2017, 2018, 2019, 2025, 2026).

- Chair for Ph.D. viva, UCD (2017, 2019, 2021, 2022, 2023, 2024, 2025, 2026).

Professional Activities

- Interim Head of Subject in Statistics, School of Mathematics and Statistics, UCD (2026).
- Head of Graduate Teaching and Learning, School of Mathematics and Statistics, UCD (2022-).
- Director of Online Programmes, School of Mathematics and Statistics, UCD (2017-).
- Co-director of Data Science programme, ADVANCE Centre for Professional Education (2020-).
- Committee Member, Irish Society of Human Genetics (2018-2025).
- Statistician, Animal Research Ethics Committee, UCD (2017-2026).
- Education Officer, Irish Statistical Association (2017-2019).
- Organising Committee, Conference of Applied Statistics Ireland (2017).
- Refereeing: Genetics; PLoS Computational Biology; Molecular Ecology; Genome Research; Methods in Ecology and Evolution; Journal of Heredity; Biometrika; Machine Learning; Journal of Computational and Graphical Statistics; Annals of Applied Statistics; Journal of the Environmetrics Society; Journal of Statistics and Computing; Statistical Analysis and Data Mining; Animal Behaviour; Molecular Ecology Resources; Network Science; Transactions on Knowledge and Data Engineering; Pattern Analysis and Applications; International Statistical Institute World Congress 2011, NIPS (2014), AISTATS (2012,2013).
- Organiser of DPhil / postdoc seminar series, Dept. of Statistics, University of Oxford (2013-2016).
- Green Impact committee, Dept. of Statistics, University of Oxford (2013-2016).
- Interview board for hiring to CeADAR (Centre for Applied Data Analytics Research) (2013).
- Exam marking for Mathematics, University of Oxford, (2015, 2016).
- Facilitator of academic taster sessions and application conferences for Mansfield College (2015).
- Irish Supercomputer List Maintenance Committee (2013-2017).

Preprints

Integrative genomic and transcriptomic analyses identify functionally relevant causal genes for exercise in a large animal model Mian Feng, Thomas J Hall, John F O'Grady, Kseniia Maksimova, Michael Salter-Townshend, John A Browne, David E MacHugh, Lisa M Katz, Beatrice A McGivney, Emmeline W Hill

Detecting genomic regions enriched for reciprocal recombination in autism spectrum disorder Catherine F Mahoney, Michael Salter-Townshend, Darren J Fitzpatrick, Denis C Shields bioRxiv 2026.05. 26.727863

Random subsamples of animal populations can reveal intrinsic differences in sociality with key implications in ecology, conservation and disease transmission Kimberly Conteddu, Prabhleen Kaur, Michael Brown, Julian Fennessy, Stephanie Fennessy, Emma Hart, Bawan Amin, Anna David, Laura L Griffin, Jane Faull, Stefano Grignolio, Francesca Brivio, Amy Haigh, Liam Kirwan, Michael Salter-Townshend, Simone Ciuti bioRxiv, 2024.11. 07.622426

Journal Publications

Prospective categorisation of maternal care style in Thoroughbred broodmares Alexandra L Moss, Orlagh O'Reilly, Amy Rand, Amy R Holtby, Siobhan Mullan, Katharyn Mitchell, Emmeline W Hill, Michael Salter-Townshend, Lisa M Katz Applied Animal Behaviour Science 107004

Discrimination of beef production system and regional geography by multivariate analysis of stable isotope ratios (C, N, S, O, H) Hannah Whyte, Raquel Cama-Moncunill, Peter G Dunne, Aidan P Moloney, Frank McDermott, Matta Ebaid, Michael Salter-Townshend, Frank J Monahan, Olaf Schmidt Food Control 185

Discrimination of Beef from Predominantly Grass-Fed and Other Production Systems Using the Trace Elemental Profile of Muscle Hannah Whyte, Frank McDermott, David van Acken, Peter G Dunne, Aidan Moloney, Raquel Cama-Moncunill, Michael Salter-Townshend, Frank J Monahan, Olaf Schmidt Journal of Agricultural and Food Chemistry 73 (50) 32169-32182

Integrative genomics identifies candidate genes underlying trypanotolerance in hybrid African cattle

Gillian P McHugo, James A Ward, Said Ismael Ng'ang'a, Laurent AF Frantz, John A Browne, Michael Salter-Townshend, Grace M O'Gorman, Kieran G Meade, Emmeline W Hill, Thomas J Hall, David E MacHugh Evolutionary Applications 19 (6)

Genome-wide local ancestry and the functional consequences of admixture in African and European cattle populations Gillian P McHugo, James A Ward, Said Ismael Ng'ang'a, Laurent AF Frantz, Michael Salter-Townshend, Emmeline W Hill, Grace M O'Gorman, Kieran G Meade, Thomas J Hall, David E MacHugh Heredity 134 (1), 49-63

"Using an agent based model to inform sampling design for animal social network analysis", P Kaur, S Ciuti, M Salter-Townshend, DR Farine, Behavioral Ecology and Sociobiology 79 (3), 1-14

"A protocol for assessing bias and robustness of social network metrics using GPS based radio-telemetry data", P Kaur, S Ciuti, F Ossi, F Cagnacci, N Morellet, A Loison, K Atmeh, P McLoughlin, AK Reinking, JL Beck, AC Ortega, M Kauffman, MS Boyce, A Haigh, A David, LL Griffin, K Conteddu, J Faull, M Salter-Townshend, Movement Ecology 12 (1), 55

"How group structure impacts the numbers at risk for coronary artery disease: polygenic risk scores and nongenetic risk factors in the UK Biobank cohort J Zhao, A O'Hagan, M Salter-Townshend Genetics 227 (3)

"A scoping review on bovine tuberculosis highlights the need for novel data streams and analytical approaches to curb zoonotic diseases", K Conteddu, HM English, AW Byrne, B Amin, LL Griffin, P Kaur, V Morera-Pujol, KJ Murphy, M Salter-Townshend, AF Smith, S Ciuti Veterinary Research 55 (1), 64 2

"Genomic insights into the population history and adaptive traits of Latin American Criollo cattle", JA Ward, SI Ng'ang'a, IAS Randhawa, GP McHugo, JF O'Grady, JM Flórez, JA Browne, AM Pérez O'Brien, AJ Landaeta-Hernández, JF Garcia, TS Sonstegard, LAF Frantz, M Salter-Townshend, DE MacHugh, Royal Society Open Science 11 (3), 231388

"A simulation study for multifactorial genetic disorders to quantify the impact of polygenic risk scores on critical illness insurance", J. Zhao, M. Salter-Townshend, A. O'Hagan European Actuarial Journal, 1-39

"Genome-wide local ancestry and direct evidence for mitonuclear co-adaptation in African hybrid cattle populations (Bos taurus/indicus)", J.A. Ward, G.P. McHugo, M.J. Dover, T.J. Hall, S.I. Ng'ang'a, T.S Sonstegard, D.G. Bradley, L.A.F. Frantz, M. Salter-Townshend, D.E. MacHugh, iScience (2021).

"Polygenic Risk Scores for Determining Number at Risk", J Zhao, A O'Hagan, M Salter-Townshend, IRISH JOURNAL OF MEDICAL SCIENCE 191 (SUPPL 3), S70-S70

"Static and dynamic methods in social network analysis reveal the association patterns of desert-dwelling giraffe", E.E. Hart, S. Ciuti, L. Herrmann, J. Fennessy, E. Wells, M. Salter-Townshend, Behavioral Ecology and Sociobiology 76 (5), 62

"Computational modelling of Chromosomally Clustering Protein Domains In Bacteria", Chiara E. Cotroneo, Isobel Claire Gormley, Denis C. Shields, Michael Salter-Townshend, (2021).

"Fine-scale Inference of Ancestry Segments without Prior Knowledge of Admixing Groups", M. Salter-Townshend, S.R. Myers, Genetics (2019).

"Statistical challenges in estimating past climate changes", J. Sweeney, M. Salter-Townshend, T. Edwards, C.E. Buck, A.C. Parnell, WIREs Computational Statistics (2018).

"Latent Space Models for Multiview Network Data", M. Salter-Townshend, T.H. McCormick, Annals of Applied Statistics (2017).

"Online Trans-dimensional von Mises-Fisher Mixture Models for User Profiles", X. Qin, P. Cunningham, M. Salter-Townshend, Journal of Machine Learning Research (2016).

"The influence of network structures of Wikipedia discussion pages on the efficiency of WikiProjects", X. Qin, P. Cunningham, M. Salter-Townshend, Social Networks (2015).

"Role Analysis in Networks using Mixtures of Exponential Random Graph Models", M. Salter-Townshend, T.B. Murphy, Journal of Computational and Graphical Statistics (2014).

"Bayesian Inference for Palaeoclimate with Time Uncertainty and Stochastic Volatility", A.C. Parnell, J. Sweeney, T.K. Doan, M. Salter-Townshend, J.R.M. Allen, B. Huntley, J. Haslett, JRSS Series C (2014).

"Mixtures of Biased Sentiment Analysers", M. Salter-Townshend, T.B. Murphy, Advances in Data Analysis and Classification (2014).

"Variational Bayesian Inference for the Latent Position Cluster Model", M. Salter-Townshend, T.B. Murphy, Computational Statistics and Data Analysis (2012).

"Fast Inversion of a Flexible Regression Model for Multivariate Pollen Counts Data", M. Salter-Townshend, J. Haslett, Environmetrics (2012).

"Review of Statistical Network Analysis: Models, Algorithms, and Software", M. Salter-Townshend, A. White, I. Gollini, T. B. Murphy, Statistical Analysis and Data Mining (2012).

Discussion on "Approximate Bayesian Inference for Latent Gaussian Models Using Integrated Nested Laplace Approximations", M. Salter-Townshend, J. Haslett, N. Friel, JRSS Series B (2009).

"Bayesian Palaeoclimate Reconstruction," J. Haslett, M. Whiley, S. Bhattacharya, M. Salter-Townshend, S. Wilson, J.R.M Allen, B. Huntley, F.J.G. Mitchell, Read Paper, JRSS Series A (2006).

Book Chapters

"Sentiment analysis of online media", M. Salter-Townshend, T.B. Murphy, Algorithms from and for Nature and Life. Studies in Classification, Data Analysis, and Knowledge Organization (2012).

Peer Reviewed Conference Proceedings

"Local Ancestry Inference in Non-Model Organisms", M. Salter-Townshend, European Meeting on Mathematical Genetics, Dublin (2019).

"Exploring the Relationship between Membership Turnover and Productivity in Online Communities", X. Qin, M. Salter-Townshend, P. Cunningham, ICWSM 8 (2014).

"Latent space models for multiview network data", M. Salter-Townshend, T.H. McCormick, IEEE GlobalSIP Symposium on Emerging Challenges in Network Sensing, Inference, and Communication (2013).

"Clustering Biased Sentiment Analysers", M. Salter-Townshend, T.B. Murphy, MBC2, Catania, Sicily, Italy (2012).

"Bias Correction in Sentiment Analysis", M. Salter-Townshend, T.B. Murphy, invited paper to Symposium of the International Federation of Classification Societies, (with proceedings) (2011).

"A Latent Space Mapping for Link Prediction", M. Salter-Townshend, A. Brew, NIPS Workshop on Networks across Disciplines in Theory and Applications (2010).

"Variational Bayesian Inference for the Latent Position Cluster Model", M. Salter-Townshend, T.B. Murphy, Analyzing Networks and Learning With Graphs workshop, NIPS (2009).

"Zero-Inflation of Compositional Data", M. Salter-Townshend, J. Haslett, Proceedings of the 21st International Workshop on Statistical Modelling (2006).

"Modelling Temporal Uncertainty in Palaeoclimate Reconstructions", J. Haslett, A. Parnell, M. Salter-Townshend, Proceedings of the 21st International Workshop on Statistical Modelling (2006).

Magazine Articles

"Analysing My Facebook Friends", M. Salter-Townshend, Significance, magazine of the Royal Statistical Society and the American Statistical Association (2012).

Ph.D. Thesis

"Fast Approximate Inverse Bayesian Inference in non-parametric Multivariate Regression (with application to palaeoclimate reconstruction)", Trinity College Dublin (2009).

Invited International Conference Presentations

"Social Network Analysis", M. Salter-Townshend, keynote talk at Eurodeer XI, Dublin, (2019).

"Clustering-by-Role: Modelling Ego Networks as mixtures of ERGMs", M. Salter-Townshend, T.B. Murphy, invited paper to International Statistical Institute World Congress, Dublin, Ireland (2011).

"Variational Bayesian Inference for the Latent Position Cluster Model", M. Salter-Townshend, T.B. Murphy, Modelling and Computation for Social Networks, Pacific Institute for the Mathematical Sciences, Whistler, Canada (2010).

"Variational Bayesian Inference for the Latent Position Cluster Model", M. Salter-Townshend, T.B. Murphy, Statistical Methods for the Analysis of Network Data in Practice (2009).

Published Software

MOSAIC is a tool for modelling multiway admixture using dense genotype data. Available at `https://maths.ucd.ie/~mst/MOSAIC/`

aniSNA (Statistical Network Analysis of Animal Social Networks), R package published on the CRAN network.

VBLPCM (Variational Bayesian inference for the Latent Position Cluster Model for networks), R package published on the CRAN network.

R code for the example problems in "Review of Statistical Network Analysis: Models, Algorithms and Software", available at `https://maths.ucd.ie/~mst/networks/R/`

Honours and Awards

Teaching Excellence Award, College of Science, UCD (2020).
Recognition Award, Dept. of Statistics, University of Oxford (2015).
Junior Research Fellowship, Mansfield College, University of Oxford (2014).
Norwegian Government Scholarship Pool funding to visit NTNU in Trondheim (2007).
Student Poster award, Conference of Applied Statistics in Ireland (2007).
Four year Ph.D. funding from Science Foundation Ireland (2004).
Graduated top of Computational Physics class, Trinity College Dublin (2003).